The
WOOD DUCK

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HAMILTON NATURALISTS' CLUB
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The Hamilton Naturalists' Club promotes public interest in the study, conservation and appreciation of our natural heritage. Meetings are monthly from September to May inclusive and visitors are always welcome. Outdoor field events are scheduled for every month, and a cmplete listing of the entire season may be obtained from the membership secretary.

A WORD FROM THE PRESIDENT

Re Christmas Bird Count

Did you participate in the Christmas Bird Count? You didn't! Don't feel that such activities are only for the experts. Everyone can contribute and I do mean you. It is only by getting out and becoming involved that one gains experience.

As you know, I am far from being an expert but Audrey Hawkes and I have enjoyed making a census of the birds in our particular territory in Dundas for the Spring, Fall and Christmas Counts since 1976. We keep our own records and each year we feel that we are becoming more competent and now, fewer unidentified species are slipping by us. We are getting to know the area and where to look for the birds and this you can do too. There are still many places within the 15 mile radius of Dundurn Castle that are not being adequately covered because we just do not have sufficient counters. Plan to become involved with the Spring Count in May. It is fun and rewarding too - a real learning experience.

Sincere thanks, once again, to George North for organizaing and compiling the 1981 Christmas count. If you participated, and we thank you for your help, don't forget to forward your $2.00 fee to George so that he will be able to complete the results and balance his books.

Re Baillie Birdathon 1981

David Hussell of the Long Point Bird Observatory reports that the 1981 Birdathon was the best ever and wishes to thank all Birdathon participants and their sponsors.

Those participating on behalf of the Hamilton Naturalists' Club were

	Amount raised
Bob Curry	$ 1,608.08
Jean Crankshaw	235.10
Sarah Wood	109.00
Chauncey Wood	48.88
	$ 2,001.06

As previously agreed 25% of the proceeds raised by club representatives gpes to that club. On this basis $500.27 has been forwarded to the H.N.C. and has been deposited in the Sanctuary Fund.

Sincere thanks to Bob, Jean, Sarah and Chauncey for their interest and effort in support of this worthwhile endeavour and to all who sponsored them.

L.P.B.O's sjare pf tje Birdathon proceeds supports projects such as the Ontario Heronry Inventory, the Ontario Lakes Loon Survey and the Ontario Breeding Bird Atlas, as well as contributing to the James L. Baillie Memorial Fund.

Our thanks too, to Bruce Duncan who once again did a fantastic job of organizing the sponsors for our club representative, Bob Curry and then followed with an excellent system for collecting the returns. Bruce spent the day in the field too and both he and Bob were among the 25 sponsored participants who raised $250.00 or more and they were awarded Gift Certificates from Nature Canada Bookshop for their efforts.

Also, as everyone was aware, there were draws for 4 limited edition prints by Robert Bateman. In the draw from among Birdathon participants, our own Bob Curry won the "Great Blue Heron". Congratulations Bob.

As guest birder for 1981, we congratulate long time H.N.C. member, Robert Bateman for his outstanding effort on behalf of the Baillie Birdathon. We are proud and thrilled with the success of this year's event.

A Word from the President (continued)
The 1982 Birdathon at Long Point is tentatively scheduled for May 1. Roger Tory Peterson will be the guest birder. Plan to participate.

Re Ross Thompson Trophy
This trophy is presented to the Junior member of our club who sights the greatest number of species of birds in the Hamilton area(25 mile radius of Dundurn Castle) in the calendar year. All participants should forward their lists to Bob Curry, 92 Hostein Drive, Ancaster before the end of February. Please use the Hamilton Naturalists' Club official check-list for this purpose.

It's time now to get started on your 1982 list. Good luck.

Re Club Badge and Bird Check-lists
Did you know that the H.N.C. has an official club badge,featuring the Wood Duck? These are on sale at the Membership Desk at each meeting for $1.25 (a realbargain considering to-day's prices) or through Barry Cherriere, 506-575 Queenston Road, L8K 1K1.

Also Barry has a supply of the Hamilton Naturalists' Club official bird check-list for the Hamilton area at 20 for $1.00.

If ordering either of these items by mail, please include 30 cents postage for the badge and 60 cents postage for 20 check-lists.

Re the Wood Duck
One of these months you may not receive a copy of the Wood Duck, not because of the raised postal rates nor through lack of material to print. Sincere thanks to all who are contributing articles and such informative and interesting ones too. Keep up the good work and Marvin Grove, our editor, will be happy. No, the problem is lack of hands on collating night. Sheila Forbes, 106 Reding Road, Ancaster, telephone 648-2859 needs at least 6 helpers the 4th Monday of each month (Feb. 23, March 23, April 27) for 2 hours beginning at 7 p.m. You have been forgetting to volunteer your services on meeting nights and this leaves us scrambling for help when deadline draws near. Do sign up for one or more nights when you are at the next meeting or give Marvin a call, 528-5633 so he will know that he can count on you.

The January issue was assembled by Ruth Grove, Joan and Sheila Forbes, Phyllis Vair and myself assisted by my three nephews, Adam, Bruce and Danny (who were commandeered at the last minute) in just over 1½ hours. Sincere thanks to these folk for their help. So far we have had only one offer of help for January 25th. Hope we manage!

Don't miss the February meeting. Come out and enjoy Louise Elder's wildflowers. Mary and Norm Pomfret will be at the door to greet you.

Hazel Broker

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C O R R E C T I O N

THE ROYAL CANADIAN INSTITUTE 1982 PUBLIC LECTURE SERIES

All lectures as listed in the January Wood Duck are to be held Sundays at 3:15 p.m. in the Medical Science Auditorium, University of Toronto

EXCEPT

the Feb. 7 lecture by Robert Bateman, Artist, entitled ART AND NATURE, which is to be an evening meeting beginning at 8:15

CLUB FIELD EVENTS

SATURDAY, FEBRUARY 27, 1982, 6 a.m.

Rise early and PROWL FOR OWLS. Meet at the Dominion Store parking area, east side of Hwy. #2 just past Fidler's Green Road, Ancaster. Dress warmly for this morning only outing and be prepared to walk.

Leader: John Olmsted Hamilton 522-0409

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NEW MEMBERS - DECEMBER

Kenneth Hodd, 71 Grant Blvd., Dundas, Ontario L9H 4L9

Mr. & Mrs. R. Fortier, 104 Pine Street, Ancaster,Ontario L9G 2T7

Mr. & Mrs. N. White, 995 Courtland Dr., Ancaster, Ontario L9G 2T7

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ADVANCE NOTICE

Because of the Easter Holiday Weekend
the April Meeting will be held

TUESDAY, APRIL 13

instead of April 12 as noted in the
calendar of events.
Red Mason of Etobicoke will be the Speaker
his topic "Bird Control at Airports"
Please make a note of this change on
your calendar

LETTERS TO THE EDITOR

Letters to the editor, for possible publication in the Wood Duck, would be appreciated from our readers. These should be expressions of opinion and comments on Wood Duck articles or pertinent events. Any letter may be edited or reduced in length to make it suitable for our purposes.

Letters should be addressed to:

THE WOOD DUCK
500 MAIN ST. EAST
HAMILTON, ONT.
L8N 1K7

MINUTES OF GENERAL MEETING OF MEMBERS OF THE HAMILTON NATURALISTS' CLUB held at the Headquarters of the Royal Botanical Gardens, Burlington, Ontario on Monday, January 11, 1982

Despite the elements approximately 70 members attended the January meeting. They were greeted by Mabel and Bob Stamp and Hazel Broker, President, chaired the meeting.

The Foyer slide show consisted of photographs taken by Robert Bateman. They included shots from many parts of the world as well as Canada and Robert was on hand to give a few comments. Thank you very much.

George North gave us a short report on the Christmas Bird Count, mentioning some of the noteworthy sightings.

Hazel reported on the James Baillie Birdathon. Bob Curry was the Club representative and he, together with three other Club members, Jean Crankshaw, Sarah and Chauncey Wood, raised just over $2,000. for the Birdathon. The Club has received cheques for $500.27, being 25% of the total raised and this money has been put in the Sanctuary Fund.

The Club has received a letter from a member, Ruth Atkinson, concerning trapping in Dundas. Members who had views on this subject were advised of a meeting of a Council Committee to be held later this month in Dundas, which they could attend.

Bill Campbell introduced our speaker for the evening, Bill Gilmour. Bill is a Club member, a naturalist and photographer. One of his great interests is the trees of Ontario. His topic for the evening was "Arctic Travel" and we were treated to a fascinating record of trips Bill has taken from Alaska in the west to the shores of Baffin Island in the east, including a river trip down the Mackenzie River, visits to Bathurst Inlet, Cambridge Bay and Ungava.

Bill's sense of history was evident from the photos from the Yukon. The photographs of wild flowers in profusion and of Arctic birds whetted one's interest.

Bill Tindale thanked Bill for his presentation with an interesting poem.

After the meeting, members and guests partook of refreshments provided by Shirley Klement and her committee.

Barbara Reid, Secretary

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MONTHLY GENERAL MEETING	MONTHLY GENERAL MEETING
TIME	MONDAY, FEBRUARY 8, 1982 at 8 p.m.
PLACE	Royal Botanical Gardens auditorium 680 Plains Road, Burlington
SPEAKER	"Consider the Lilies of the Field" by Dr. Louise Elder of Burlington - a narrated slide show about the wild-flowers of our area.
NEXT MEETING	Monday, March 8, 1982
VISITORS WELCOME	STAY FOR FELLOWSHIP & REFRESHMENTS

BIRDING-ON-THE-SIDE IN THE SOUTH-WEST U.S.A.

by Michael Clark

Birding-on-the-side is not a new development in birding; it is a type of birding as old as birding itself. The problem-if we agree there is a problem-is that it has never been adequately defined.

Now, Birding-on-the-side could have a variety of meanings. Well,what are some of these? For instance, does it mean a specialized form of birding which can be done from the side or sides of various things: such as hills,buildings, mountains, pyramids,cliffs, bell-towers,telephone poles,evergreen trees,and the like? Naturally, to the perfervid lister, such a novel twist or kink may sound very intriguing, so we cannot entirely rule out this possibility. Or, is Birding-on-the-Side limited only to those species which one sees while lying on one's side (as opposed to be being on one's feet or seated.), a unique idea which, once again, the avid lister may consider very attractive? (Of course, this immediately brings to mind other unusual possibilities which may prove appealing to an inveterate lister, such as those birds seen(and identified!) only while standing on one leg, on the top of one's head, on one hand, etc. But these, really, are outside the bounds of the definition we are seeking.)

While far from discounting the above as potential definitions, neither one is what I, personally, mean by Birding-on-the-Side. When it comes right down to it, I must confess I can only give what is in reality a very personal, and I imagine biased, interpretation of this elusive term. (I realize fully, of course, that you may not agree with me: but that's all right.)

After much reflection then, I finally came to the hard conclusion that Birding-on-the-Side has three distinct phases. But before we get into these, perhaps it will be of some use to think of a workable meaning for "on-the-side". By "on-the-side" I mean something - anything - that is over and above or in addition to, the central activity or whatever that is under way. Thus, "side" here has somewhat the meaning of "side-dish", as opposed to the main course of a meal. Or-much closer to the sort of definition I am searching for- "side" is very similar to the term "side-trip", which, as you know, is a little excursion added on and not integral to the main focus or goal of that vacation journey you are taking.

Now, as to our three distinct phases. If you and your family are taking what is officially designated as a "family trip" to the lower half of California and parts of Nevada and Arizona, then that is, so to speak, the main dish or purpose of the trip. There is - there can be - absolutely no doubt that this is the principal reason for your going. And, in fact, for the family as a whole, this is the most important thing.

But now: to consider one of our phases. We will call it Phase One: that phase, which for the Eastern birder hoping for a new species or two, is quite important but definitely the least productive. Let us say we are all going to Disneyland or Universal Studios (as we all must), or that we are paying a visit to the San Diego Zoo or the Grand Canyon. Who would deny that each of these attractions presents untold enjoyment for everyone concerned? Who, for example, would dare to put one's impressions of the Grand Canyon into mere words? But the side-tripping birder(that secretive, rather sneaky, individual) must, if he or she is to be accorded Phase One ranking, be accompanied by two very important essentials: his(or her) binoculars, plus a guide book for those Western birds!

So there we are. Granted, as already mentioned, in this phase the pickings are often lean. (One is not deliberately birding, you understand, but milling around as a family with everyone else.) Nothing at Disneyland or Universal

Birding-on-the-Side in the South-west U.S.A. (continued)
Studios. A Hooded Oriole busily feeding its young at the San Diego Zoo. A Varied Thrush eating berries near the parking lot across from the L.A.County Museum of Art. An excursion trip around San Francisco Bay, however,(Temp. 58F Aug.12) ,ay (and did) yield Common Murres and New Zealand and Pink-Footed Shearwaters. As for Grand Canyon, as one might imagine, we have there a special case which proves profitable no matter what the Phase. One can, for instance, be gazing, altogether speechless (some people will talk!), at all that timeless splendour, while at the same time noting with some interest the presence of White-Throated Swifts, the soaring Turkey Vultures and Ravens, as well as perhaps a few Lazuli Buntings and a Black Vulture.

Which brings us to Phase Two. In so far as a tightly programmed family excursion allows, Birding-on-the-Side at the Phase Two level begins to approach the Wow! category. This is where the family takes in a place together,where, just by coincidence of course, there is a decided probability of new birds being seen. Thus, a quick walk around Muir Woods National Monument produces the first Pygmy Nuthatch, Stellar's Jays, and a possible Hammond's Flycatcher. Further up the coast the alert side-birder begins to wallow just a bit in the neighbourhood of Great Egret flocks, Willets, large numbers of D.-C. Cormorants, and a preening Snowy Egret or two. (Wow.) These are seen at fairly close range in the inner ponds and lagoons. One notes with particular interest the Cormorants churning like crazy over the lagoon in a ragged line, each snatching up a fish with every dip, while the entire flock is being major-domoed by a wildly flapping buffoon of a Brown Pelican. Farther up the coast at Point Reyes National Seashore, one admires the Red-Tails and Harriers drifting over the misty, moor-like hills, the California Quail scuttling off the road into the woods, the Turkey Vultures (on the way) wheeling up in pairs from behind every second hill, and from the Light-House look-out: the great rocks 200 feet below covered with thousands of Manx Shearwaters, the Brown Pelicans flying their perfect V six inches above the choppy ocean, and the ocean itself studded with the black and white of Coots and Pigeon Guillemots. (Wow again.)

But it is in the Third Phase of side-birding that the real birding dividends begin to roll in. This Phase (sometimes combined a little with Phase Two) could properly be called deliberate birding; that is, what it involves is the odd hour or two, usually in the early morning, when the Birder-on-the Side gets up and out on his (or her) own. Naturally, it would be recommended that for this Phase in particular, the side-birder be prepared beforehand by perhaps boning up on Arnold Small's The Birds of California, or by dipping selectively into The Bird Watcher's America (ed. O.S. Pettingill, Jr.), by way of expectation-raisers. But, at this point, let's be candid: in this Phase the Birder-on-the-Side becomes the birder in fact. He(or she) is not distracted by the multitudes of dedicated 6:45 a.m. joggers in the San Francisco Wharfs area, for instance. Of course not! He(or she) is busy(telescope now in play!) checking off the Western and Heermann's Gulls, the Least and Forster's Terns, the flock of Brewer's Blackbirds darting about as greedy as Starlings beneath the arc of a lawn sprinkler. Or if it's early morning in the Painted Desert area (Gray Mt.,Arizona) let's say, he is out watching that cute little, zippy, Loggerhead Shrike, scattering up Horned Larks,pinning down an immature Lark Sparrow, or ticking off an Ash-Throated Flycatcher,Western Kingbirds, and a female Bullock's Oriole. (The motel lady had said: "Birds? What birds? There's no birds around here.") Nor is the Phase Three birder deterred in the least by the gumbo muck that surrounds the renowned Mono Lake staging area. Why should he be, for pity's sake? Isn't that an Avocet? How many Eared Grebes are there - a hundred? Why, those look like Wandering Tattlers! Aren't those some Northern Phalaropes over there, spinning round like China tops, and a Wilson's! Similarly, a family walk through the Grand

Birding-on-the-Side in the South-west U.S.A. (continued)
Canyon grounds (a Phase Two situation with Phase Three intentions) turns up Mountain Chickadees, Scrub Jays, two very friendly Lesser Goldfinches, Grey-headed Juncos, a resplendent Violet-Green Swallow feeding its young in the Hopi House Wall, Canyon Wrens, Towhees, Western Bluebirds, a female Black-Headed Grosbeak, and a Plain Titmouse; while a more genuine early morning Phase Three jaunt amongst the joggers (OOooo! Uuh!) and the tour buses scares up those foraging Pinyon Jays, a Broad-Tailed Hummingbird feeding a newly fledged offspring, and a brightly singing Black-Throated Grey Warbler. (Wow!)

Now you might conceivably say here: So what? There you were in the American Southwest for a few weeks and you did not see all the birds available! How could you? You mean you did not take a crack at the Condor? I heard no mention of the Black Oystercatcher, the Pygmy Owl - all those Sparrows and Thrashers, not to mention a Roadrunner! And what happened to the raptors?

Well, more birds were seen, of course, And, who is to dispute the objective of going after as many as you can - if you are on a trip devoted only to birding.

On the other hand, what we have been trying to define here is Birding-on-the-Side whith its three distinct Phases, where the main purpose of the vacation trip is a family one, with the birding being secondary. Admittedly, for the birding purist, side-birding has its limitations - but it can be very rewarding, nevertheless.

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'WILDLIFE and MAN'

Man has found ways of circumventing many of the natural laws which govern the so-called 'balance of nature' and there is no doubt that some of his activities are detrimental to certain forms of wildlife. There are those who hold the view that all this is the inevitable result of man's own evolution - in other words, that anything which cannot withstand the pressures his civilization puts on the environment deserves its fate. In effect they are using the old 'survival of the fittest' cliche, the fittest in their view being man.

Others would hold an opposite view - that man has evolved a sense of responsibility and an ability to choose, to some extent at any rate, the sort of world in which he wishes to live, he has a responsibility to see that his own progress is not needlessly wasteful in terms of destroying wildlife and its habitates. The second point of view, which is shared by probably all naturalists, suggests that man can go on increasing his hold over the world in all sorts of ways but that there is no need for him to do so at the expense of wildlife. Wildlife and man can co-exist in harmony, even if to some degree it is on man's terms.

(Reprinted from 'A NATURAL HISTORY OF OWLS' by Michael Everett. Hamlyn Publications.)

McMASTER PROFESSOR,D.C. FORD, EXAMINES CAVES AND ASSOCIATED LAND FORMS

Caves and the landforms associated with them have long been an interest of Dr. D. C. Ford, a professor in the Department of Geography. He has conducted extensive explorations in caves around the world, and is currently involved in experiments concerning the storage of radioactive waste.

"There is a wide variety of caves in Canada," Dr. Ford said. "When we're up in Wood Buffalo National Park in Alberta next summer we may find a very big cave." Dr. Ford said he suspects that there is a large number of undiscovered caves in the country, though many of them may not be easily accessible. "The kinds of caves I'M concerned with develop in limestone or dolomite or gypsum, so you look for areas where those kinds of rocks occur. That amounts to about 15 per cent of the surface area of Canada. Secondly, if the ground is permanently frozen, as much of the north is, that makes them difficult to get into if you can find them, since they may be sealed up with ice. Thirdly, some lowland regions are such that finding a cave means finding water. Since the water is very cold in Canada, they're not nice places to explore,"he said.

NEW DISCOVERY NEAR ST. CATHARINES

The majority of caves which are relatively easy to explore are therefore found in hilly regions in Newfoundland, Quebec,Ontario, and in the mountains of Alberta and British Columbia. "The point to emphasize is that caving is a very young sport in Canada. There are only about 100 activists, and it's a very big country. There are probably a lot of caves yet to be found.", He noted that a fairly large cave was recently discovered near St. Catharines. Some small ones are located at Rattlesnake Point, but Dr. Ford said that anyone interested in examining larger caves should go to the Bruce Peninsula or the Ottawa Valley.

For those interested in caving, Dr. Ford has some advice. "Formally, as an experienced caver, I should advise you to join a club and train with them in the proper safety techniques and so on. Informally, I'd suggest that you just get yourself a hard hat and a light and go off to investigate some of the small cracks in the Niagara Escarpment. If you enjoy yourself, you can join a club. But get used to the idea of going long distances, because the big caves are a long way away," he said.

A few safety precautions are imperative. "One must be accompanied, Caving alone is not on,"Dr. Ford said. "You have to let people know where you're going, and your anticipated time out. You need sensible light; something more than a small flashlight from the hardware stoe. You need spare lights in case the main one fails. That's imperative. And, in may larger caves, you need specialized climbing equipment and clothing to keep you warm. You might find yourself wet right through for 15 hours in a cave where the temperature is six degrees Celsius. That requires special clothing,maybe a heavy-guage wet suit. But that comes with more experience, when youre attacking the bigger ones. Plenty of light, sensible shoes, hard hat and the oldest clothes you have, because you won't use (the clothes) for anything else again. It's the hardest sport in the world on clothes, there's no question."

Different areas of Canada offer a variety of cave types. Caves in the Rockies, for example, tend to be very deep, and feature large shafts and chambers. A cave which has just been discovered on Vancouver Island loops up and down and contains agreat deal of water in the bottom parts of the loops. A man who telephoned Dr. Ford to inform him of its existence called it the biggest discovery ever on the island. "Every variety of cave is known in Canada. The only point is that they're not as well decorated with stalacites and stalagmites and such things as those further south. The stalagmites get richer as the climate gets warmer," said Dr. Ford.

McMaster Professor examines Caves & Associated Land Forms (continued)

"Caves are just a part of the interest of my research group and myself," said he. "We're also interested in the land forms that develop around caves." Sinkholes are an example of such land forms. These develop when underground caverns no longer support the earth on top of them. The result is a large depression. "Some of the collapses are quite catastrophic. One occured in Newfoundland where the ground fell 70 feet in a matter of seconds. Another in Florida became 300 feet wide and 100 feet deep in about two days."

Some people from Wood Buffalo National Park were in touch with Dr. Ford recently to find ways of detecting unknown cavities by using geophysical means. They were planning to put a new road in the park, and did not want any to collapse into a cave. "In that case," said Dr. Ford, "they have to do a preliminary scan; what we call a 'quick'look', by passing quickly over large areas and getting a rough notion of what's under the ground by looking for gravity anomalies. There's less rock between the equipment and the centre of the earth (where a cave exists), so there's less gravity." If any negative anomalies which look threatening are found, an electrical resistivity test must be conducted. A current is passed through the earth, with the electrodes set on each side of the target area. Since air is very resistant to electricity, the cave shows up as a huge area of high resistance in the electrical flow pattern. "It's a very slow process and it burns up a lot of man hours and expense. It would only be done on potentially dangerous areas," Dr. Ford said.

World Temperatures dropping

Geography Professor D.C. Ford's interest in caves has led him into many of those land forms around the world. It has also led him into areas which include climate and radioactive waste storage. It appears, for example, that the period of relatively mild weather which the world has enjoyed for the past hundred years is coming to an end.

"The pattern seems to be that from about 1100 - 1200 A.D. global temperatures, certainly those in Europe and eastern North America, dropped a little. That is believed to have wiped out the Vikings' Greenland colonies. The glaciers came back and simply advanced over their summer grazing. The winters were perhaps a little more severe and the summers less warm, but there were oscillations roughly from 1200 A.D. to 1880. After that, it began to warm up. It was noted that glaciers were receding quite rapidly in the Alps, an area where plenty of people travelled at that time. We now know that glaciers in the Canadian Rockies were doing exactly the same thing. This warm period peaked around the 1930's and 40's, and it began to fall apart from the late 50's on. Now we're going through a period of what is called peculiar weather. The winters don't seem particularly cold, but the summers are perhaps a bit cooler. Look at the last 609 days - record-breaking rains," said Dr. Ford

"I can't say how fast we're going to fall out of this (interglacial period)," said Dr. Ford, "but I can tell you what our research has accomplished. The team that Dr. Henry Schwartz and I have led since 1966 has become, at the moment, world leader in the dating of stalagmites. They grow for a while, then they stop, then start again, sometimes for 10's or 100's of thousands of years continuously. We can date the m and learn a lot about landscape evolution in that way," Dr. Ford said.

The Group has been using decay rates of radioactive isotopes and study of non-radioactive isotopes to find out what stalagmites have been doing. Uranium is soluble in most natural water. Thorium, its decay product, is not. By examining stalagmites for traces of uranium, a date can be established back to 350,000 years ago. If the stalagmite is older, the uranium has decayed too far to be useful.

McMaster Professor Examines Caves & Associated Land Forms (continued)

Temperature changes are studied by looking at concentrations of two oxygen isotopes, one with a mass of 16 and one with a mass of 18. The isotopes are contained in the mineral which forms the bulk of stalagmites, known as calcite. The mineral is broken down into its component parts, calcium, carbon and oxygen. The concentration of the oxygen isotopes then provides a clue to the behaviour of the stalagmite.

"If we could find a deep cave in southern Ontario, we could measure its temperature and find that it doesn't vary much from the mean annual temperature. The water depositing stalagmites in those caves will leave behind differing quantities of the two common types of oxygen, according to the temperature. Therefore, as the temperature of a region changes over hundreds of thousands of years so, with a small time lag, does the temperature of the cave change. We see this in the changing ratios of the oxygen isotopes to each other. Though the time lag varies, it is normally within a few tens of years. That is within our margin of eror.

"What we're doing is dating the stalagmites, going back as far as 350,000 years continuously by uranium method, knowing when they started, when they stopped and how fast theygrew in between. We can take samples from a specimen at any point, and see whether the cave was warming up or cooling down. We can't establish absolute temperatures with any confidence, but we do have some handles on how fast it was changing,"Dr. Ford said. One sample from Bermuda, for example, indicated that the mean annual temperature may have fallen as much as three degrees Celsius in 1,000 years. That 1,000 years was about 105,000 years in the past. Since Bermuda's climate is moderated by the surrounding ocean, greater extremes may have been reached elsewhere.

"We can't tell what's going to happen in this interglacial period, because the stalagmite material hasn't been deposited yet,"said Dr. Ford,"but what we can say is that this has happened in the past."

"In the past 350,000 years we certainly see two big ice ages, and probably three, There had been no reliable dates for ice ages, except the last one, in continental North America until our studies. It is the first time we can say roughly what the time span was of the glacial age before the last one," Dr. Ford said.

He emphasized that his work does not allow him to predict the weather. "We can only work in the past. And insofaras what has happened in the past is presumably going to happen again, then climatologists and other specialists can study our results, figure out what climate change mechanisms must have operated to create them, and see if those same mechanisms seem to be operating to-day. Then they can try to make forecasts. But the forecasting is for the meteorologists and climatologists, not for us,"he said.

Radioactive Waste Storage

Another facet of Professor Schwarca's and Ford's work concerns safe storage of radioactive waste. They are involved with a group which is attempting to find a reliable way to determine whether the waste, which in some cases can be dangerous for a quarter of a million years, would safely remain in underground storage if it escaped ins containers. Dr. Ford said that the thousands of years it could take for suchan event to occur makes actual testing impossible. His group is examining thepossible storage chambers, located deep underground in formations of granite. "We're looking at the stability of different uranium isotopes inside the secondary minerals (which are deposited by water in minute cracks in the granite). If the isotopes are all stable, or in equilibrium, then we can say that no water has flowed through to carry the latter away. We could therefore have an idea whether water is flowing through the rock in significant quantities and carrying uranium and radioactive species; and it's doing it in time spans that might be dangerous for storage purposes," Dr. Ford said.

CHIPMUNKS

Chipmunks, beavers, squirrels, woodchucks,rats and mice belong to the order of rodents, a group of mammals distinguished by having in each jaw two incisor teeth which grow as required throughout their lives. While some of these gnawing animals, the rat in particular, are often disliked, there is seldom heard an unkind word about the Eastern Chipmunk, found throughout Michigan. As one gardener was heard to exclaim, "I know that chipmunks are just rats in striped clothing, but I love them just the same."

The bright-eyed,sprightly chipmunk, maintaining a hoard of about half a bushel of corn, nuts,seeds, and flower bulbs in an underground storage area, is most frequently seen stuffing its cheek pouches, en route to stocking the larder, which is found at the end of a slanting 10 to 30 foot tunnel at the entrance to one of the cleanest neatest homes in the animal kingdom. The storage area, or granary, gives way to a leaf-lined nursery, then to a master bedroom. Underneath the bedroom, and giving lie to any unkind comments we may make about the lifestyle of "dumb" animals, is a toilet area.

Despite its neatness and charm, the chipmunk is an extremely unsociable animal, for, apart from very brief mating periods in spring, males and females are antagonistic to each other, living together only during the nesting period as parent or child. Indeed, a female chipmunk will not merely ignore a suitor she deems unworthy, but will evict him from her domain with a fearsome amount of cuffing biting, and noise. The underground nests are commonly found in hardwood forests or in brush areas, often in old buildings or rubbish heaps. The home range of an individual is seldom more than 100 yards in greatest diameter,while the density of population is 2 per acre at the beginning of the season, and 4 or more at the end. Litters of 2 to 8 young are produced twice a year, in May and in late July, after a gestation period of 31 days. The young will leave the nest at about one month, with a life expectancy of 2 to 3 years.

Chipmunks divide their time between intense activity and sleep. Of course, we usually observe them at their liveliest in spring and summer when they are foraging furiously for delicious tidbits for the granary. Their stuffed, swollen cheeks make us smile, even when one of our choice bulbs may have been claimed by the little hoarder. Sometimes we only hear their rather loud,sharp chipping call for which they are named. Although often referred to as a hibernating animal, the Eastern Chipmunk, like most hoarders, does not undego the death-like sleep of a true hibernator(the woodchuck, for example), but passes the severest winter months in a deep sleep punctuated by periods of waking and, according to a recent reporter of chipmunk habits, nibbling sweetmeats stored by its bed.

In the earth is an intriguing world of animals few of us have been privileged to observe. We are fortunate in having the chipmunk participate in our daytime activities, even if it means the loss of a few nuts or grains from the harvest, for the speed, agility, and grace of the little animal are inspiration to us all.

(reprinted from Nature Centre News #132, Oct/78)

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McMaster Professor (continued)

'We believe the work will have a significant application to determining whether or not radioactive waste can safely be stored undeground.' (Reprinted from McMaster University's 'Contact' magazine by permission of the editor, David Hart Dyke. Our thanks also to Dr. Ford.)

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CH RISTMAS BIRD COUNT - 1981

Hamilton, Ont. 43°16'N 79°52'W centre at York and Dundurn Sts., all points within a 15-mile diameter circle to include Hamilton, part of Burlington, Lake Medad, Waterdown, Millgrove, Greensville, Dundas, Mineral Springs, Ancaster, Southcote, Hannon and part of Stoney Creek; elevation 245 to 1000 ft.; habitat coverage: mixed woods 35%, towns 25%, open water 20%, farmland 19% and marshes 1%.

Dec. 26; 6:30 a.m. to 5 p.m. AM: overcast, continuous light snow. P.M.: overcast. Temp. 21° to 39°. Wind E, 0-10 m.p.h. Snow cover 1 to 4 in. Water mostly open. Wild food crop fair. Fifty-one observers: 43 in 26 parties; 8 at feeders. Total party-miles 480 (143 on foot, 337 by car), total party-hours 167 (137 on foot, 30 by car) plus 18 hours at feeders.

Count: Common Loon 2, Horned Grebe 2, Pied-billed Grebe 1, Double-crested Cormorant 1, Great Blue Heron 6, Mute Swan 4, Canada Goose 1500, Blue Goose 1, Mallard 1340, Black Duck 650, Gadwall 200, Pintail 7, Green-winged Teal 23, Northern Shoveler 24, Redhead 80, Canvasback 39, Greater Scaup 360, Lesser Scaup 60, Common Goldeneye 176, Barrow's Goldeneye 1, Bufflehead 172, Oldsquaw 225, White-winged Scoter 6, Ruddy Duck 6, Hooded Merganser 1, Common Merganser 9000, Red-breasted Merganser 16, Cooper's Hawk 3, Red-tailed Hawk 91, Rough-legged Hawk 10, Marsh Hawk 3, American Kestrel 33, Ruffed Grouse 15, Ring-necked Pheasant 39, American Coot 1, Glaucous Gull 5, Great Black-backed Gull 400, Herring Gull 9500, Ring-billed Gull 1700, Bonaparte's Gull 7, Rock Pigeon 1000, Mourning Dove 340, Screech Owl 8, Great Horned Owl 14, Long-eared Owl 1, Short-eared Owl 3, Belted Kingfisher 7, Pileated Woodpecker 1, Yellow-shafted Flicker 11, Hairy Woodpecker 34, Downy Woodpecker 153, Northern Three-toed Woodpecker 1, Horned Lark 3, Blue Jay 190, Common Crow 7000, Black-capped Chickadee 1040, Boreal Chickadee 1, Tufted Titmouse 1, White-breasted Nuthatch 86, Red-breasted Nuthatch 20, Brown Creeper 23, House Wren 1, Winter Wren 3, Northern Mockingbird 19, Brown Thrasher 1, American Robin 20, Hermit Thrush 2, Golden-crowned Kinglet 18, Cedar Waxwing 206, Northern Shrike 5, Starling 65,000 (roost), House Sparrow 2400, Eastern Meadowlark 4, Red-winged Blackbird 4, Rusty Blackbird 2, Bronzed Grackle 2, Brown-headed Cowbird 17, Cardinal 195, Evening Grosbeak 94, Purple Finch 5, Pine Grosbeak 25, Common Redpoll 140, Pine Siskin 170, American Goldfinch 268, White-winged Crossbill 14, Slate-colored Junco 567, American Tree Sparrow 460, Chipping Sparrow 1, White-crowned Sparrow 3, White-throated Sparrow 29, Swamp Sparrow 9, Song Sparrow 53, Snow Bunting 1060.

Total, 93 species, about 106,453 individuals. (In count area count week, but not seen count day: Ring-necked Duck, Gyrfalcon, Saw-whet Owl, Eastern Bluebird, Common Yellowthroat, House Finch.)

Observers: David Agro, Donald Babb, Robert Bernhardt, Etta Bourne, Hazel Broker, William Campbell, Michael Clark, George Coker, Bill Copeland, David Copeland, Bill Crins, Robert Curry, Edward Dinniwell, Bob Doering, Robert Finlayson, Bradley Gray, Leslie Gray, Audrey Hawkes, Raymond Hughes, Mark Jennings, Norma Lang, John and Alice Lamoureux, Maurice Laycock, Margaret McFetridge, Tony Mason, David McCorquodale, Jack McInally, Kevin McLaughlin, George North (compiler--857 Eagle Drive, Burlington, Ont., L7T 3A3), Laurel North, Minnie Odenkirchen, John Olmsted, Tom and Anne Reid, Ron Ridout, Mark Robson, Gary Rousseau, Bill Sargeant, Robert Sargeant, Kira Sibakin, William Smith, Rick Snider, Sam Tabone, Mary Thompson, Chris Varady, Robert Waldhuber, Gerry Whitworth, Anne Wingfield, Alan Wormington, Brian Wylie, (Hamilton Naturalists' Club).

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NOTEWORTHY BIRD RECORDS

Nu mber of species recorded to December 31, 1981 - 277

H orned Grebe	Dec.	26	2	Woodland Cemetery	Brad & Les Gray
Pied-billed Gre be	Dec.	26	1	Brant Inn site	William Smith
D.-c. Cormorant	Dec.	26	1	Dofasco Inlet	R. Curry, A. V. Mason
Blue Goose	Dec.	26	1	Woodland Cemetery	Brad & Les Gray
Wood Duck	Dec.	2 0	1	Oakville	Denys Gardiner
Ring-necked Duck	Dec.	28	1 fem.	Beach Canal	Kevin McLaughlin
White-w. Scoter	Dec.	28	65	Beach Canal	Kevin McLaughlin
Ruddy Duck	Dec.	12	14	Strathearne Dock	Michael Clark
Sharp-shin. Hawk	Dec.	28	1	Campbellville	Denys Gardiner
White Gyrfalcon	Dec.	28	1	Carroll's Point	Kevin McLaughlin
Merlin	Dec.	31	1	U. Middle & Bronte Rd.	Denys Gardiner
Bald Eagle	Nov.	5	1 ad.	Lowville	William Smith
Screech Owl	Dec.	20	10	Beverly Swamp	fide John Miles
Long-eared Owl	Dec.	27	1	Hopkins Tract, R.B.G.	Bob Finlayson
Saw-whet Owl	Dec.	25	1	Grey Doe Trail R.B.G.	Bob Finlayson
Red-bellied wdpkr	Dec.	20	1	Harrisburg	John B. Miles
Northern Three-toed Woodpecker	Dec.	26*	1 male	E of Sulphur Springs in valley in escarpment	Gary Rousseau & Chris Varady
Boreal Chickade e	Dec.	26	1	Mineral Springs Rd.	Wm. Smith, G. North
Tufted Titmouse	Dec.	26	1	Cole's, Christie's Cors.	H. Broker, A. Hawkes
House Wren	Dec.	26	1	Hendrie Valley	Mark Robson
Brown Thrasher	Dec.	26	1	Valley Inn Path	Wormington, Finlayson
Eastern Bluwbird	Dec.	18	1	Dundas Marsh willows	Bob Finlayson
Com. Y ellowthroat	Dec.	29	1	University Landing	Bob Curry
House Finch	Dec.	26	1	Oakville	Donald R. Gunn
Pine Grosbeak	Dec.	29	4	Valens Cons. Area	Tom & Anne Reid
Hoary Redpoll	Dec.	13F	1	U. Middle & Burloak	Denys Gardiner
Common Redpoll	Dec.	13	150	U. Middle & Burloak	Denys Gardiner
White-w. Crossbill	Dec.	25	10	Hwy. 8 above Dundas	Tom & Anne Reid
Vesper Sparrow	Dec.	31	1	Burloak Drive	Denys Gardiner
Chipping Sparrow	Dec.	26	1	Mineral Springs Rd.	G. Rousseau, C. Varady
White-crowned Sparrow	Dec.	20F	2	Winona	Raymond Hughes
	Dec.	26	3	Mineral Springs Rd.	G. Rousseau, C. Varady
Snow Bunting	Dec.	20	700	Blue Lake	John Miles

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Number of species recorded to January 16, 1982 - 77

Common Loon	Jan.	1, 3	1, 2	Beach Canal	McLaughlin; W. Smith
Great Blue Heron	Jan.	1, 5	1	Dundas Marsh	M. Clark; G. Chapple
	Jan.	16	1	Oakville	Donald R. Gunn
Mute Swan	Jan.	1	5; 6	Oakville; Bronte	D. Gardiner; M. Clark
Lesser Snow Goose	Jan.	9	1	Bronte Harbour	Michael Clark
Blue Goose	Jan.	3	1	Woodland Cemetery	W. Smith, T. Boleantu
Mallard	Jan.	1	950	Shell Pier, Bronte	Denys Gardiner
	Jan.	9	1500	Shell Pier, Bronte	Michael Clark
Gadwall	Jan.	1	13; 18	Oakville; E. Bay	Gardiner; M. Clark
Pintail	Jan.	1	4	East end of Bay	McLaughlin, Furber
Baldpate	Jan.	1	13	Kerr St., Oakville	Denys Gardiner
Green-w inged Teal	Jan.	1	16	Windermere Basin	Duncan, Furber
Northern Shoveler	Jan.	1	13	East end of Bay	McLaughlin, Duncan

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Redhead	Jan.	1	70 Woodland Cemetery	McLaughlin, Duncan
Ring-necked Duck	Jan.	1	1 fem. Woodland Cemetery	McLaughlin, Furber
Canvasback	Jan.	1	31 La Salle Park	McLaughlin, Duncan
Lesser Scaup	Jan.	2	20 East end of Bay	Denys Gardiner
Barrow's Goldeneye	Jan.	1	1 Brant Inn site	McLaughlin, Duncan
	Jan.	3	1 East end of Bay	W. Smith, T. Boleantu
White-winged Scoter	Jan.	1	3 Beach Canal	McLaughlin, Furber
	Jan.	3	1000 Lake off Canal	William Smith
Ruddy Duck	Jan.	1	4 Strathearne Dock	Michael Clark
Hooded Merganser	Jan.	1	2 La Salle Pk; Brant Inn	McLaughlin, Duncan
Rough-legged H awk	Jan.	1	6 Mount Hope Airport	McLaughlin, Furber
Bald Eagle	Jan.	16	1 ad. low over Waterdown	Lyn & Terry Lawrence
Marsh Hawk	Jan.	1, 10	1 Mount Hope Airport	McLaughlin; Chapple
Merlin	Jan.	5	1 H wy. 8 above Dundas	Tom & Anne Reid
Ruffed Grouse	Jan.	1	4 Sulphur Springs	Duncan, Furber
	Jan.	3	1 U. Middle & Bronte Rd.	Denys Gardiner
Glaucous Gull	Jan.	2	2 East end of Bay	Denys Gardiner
Mourning Dove	Jan.	15	127 Oakville feeder	Don Gunn
Screech Owl	Jan.	3	2 Sulphur Springs	W. Smith, G. North
Great Horned Owl	Jan.	3	4 Sulphur Springs	W. Smith, G. North
Long-eared Owl	Jan.	3	1 U. Middle & Burloak	Denys Gardiner
Short-eared Owl	Jan.	1, 10	3; 5 Mount Hope Airport	McLaughlin; Chapple
Belted Kingfisher	Jan.	1	1 Bronte Harbour	Denys Gardiner
Pileated Woodpecker	Jan.	3	1 Church St. Ancaster	W. Smith, G. North
	Jan.	12	1 Westdale Park	Bob Finlayson
Yellow-sh. Flicker	Jan.	1	1 Upper Middle Road	Denys Gardiner
Brown Creeper	Jan.	1	1 Willow Point	McLaughlin, Furber
N. Mockingbird	Jan.	1	1 Sydenham Lookout	Tom & Anne Reid
Brown Thrasher	Jan.	1 on	1 Roseland Burlington	Louise Hebb
AMerican Robin	Jan.	1	1 857 Eagle Drive	Laurel North
Golden-cr. Kinglet	Jan.	3	1 Sulphur Springs	W. Smith, G. North
Cedar Waxwing	Jan.	3	15 Church St., Ancaster	W. Smith, G. North
Com. Yellowthroat	Jan.	1	1 University Landing	McLaughlin et al.
Bronzed Grackle	Jan.	3	1 Ancaster	W. Smith, T. Boleantu
Brown-h. Cowbird	Jan.	13	4 857 Eagle Drive	Laurel North
Evening Grosbeak	Jan.	1	6 Fidler's Green Rd.	McLaughlin, Duncan
Purple Finch	Jan.	3	3 Church St., Ancaster	W. Smith, G. North
H ouse Finch	Jan.	1	20 Robinson St. Grimsby	Peter Thoem
Pine Grosbeak	Jan.	5	30 Cedar Springs	John Olmsted
Common Redpoll	Jan.	1	50 Hwy. 8 above Dundas	Tom & Anne Reid
Pine Siskin	Jan.	1	30 Holyrood Rd Oakville	D. Gardiner, D. Gunn
White-w. Crossbill	Jan.	6	22 Sulphur Springs	John Olmsted
Savannah Sparrow	Jan.	1	1 Burloak Drive	Denys Gardiner
White -throated Sp.	Jan.	2	1 Mineral Springs Road	R. Curry
Song Sparrow	Jan.	1	5 Burloak Drive	Denys Gardiner
Snow Bunting	Jan.	1	30 Mount Hope Airport	McLaughlin, Duncan
	Jan.	1	30 Bronte Road	Denys Gardiner
	Jan.	15	10 McMaster University	Gerald Chapple

Other more common species recorded on January 1, 1982 are:
Canada Goose, Black Duck, Greater Scaup, American Goldeneye, Bufflehead, Oldsquaw, Common Merganser, Red-tailed Hawk, American Kestrel, Great Black-backed Gull, Herring Gull, Ring-billed Gull, Rock Pigeon, Hairy Woodpecker, Downy Woodpecker, Blue Jay, Common Crow, Black-capped Chickadee, White-breasted Nuthatch, Starling, House Sparrow, Cardinal, American Goldfinch, Slate-colored Junco and American Tree Sparrow.

Please send your bird records by the 10th of the month to George W. North, 857 Eagle Drive, Burlington, Ont., L7T 3A3, or phone 634-5463.

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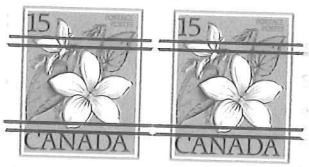

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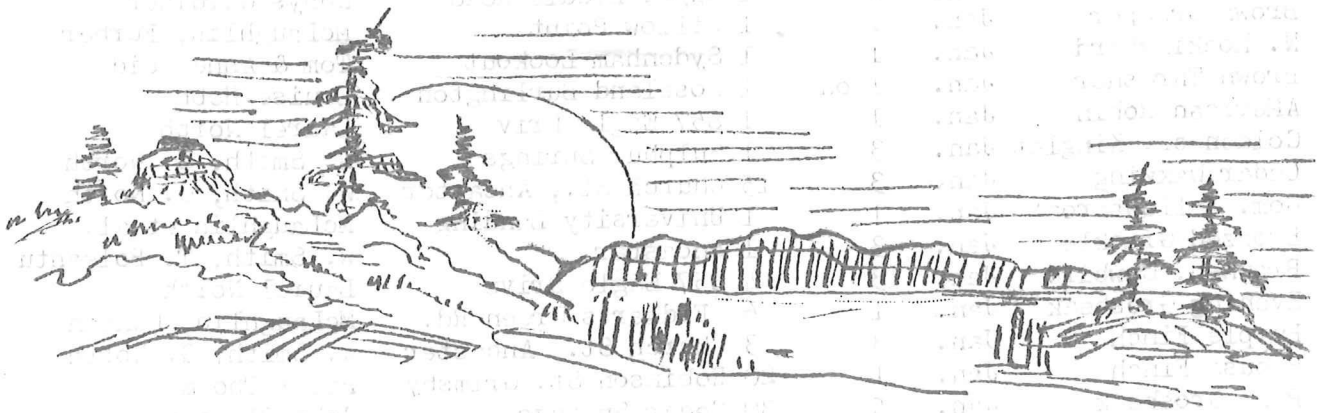

THE WOOD DUCK

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